Rikaline **GPS-6011**

GPS Receiver

User's Guide

Oct. 06, 2002

High Accuracy --- 3 Meters (50%) or Meters (90%)

Low Power -------- 26mA at 3.3V in Continuous Mode and With Active Antenna

Attractive Price -- Better Price than ordinary GPS Receiver

Rikaline Marketing Corp.

5F-1, 125, Roosevelt Rd., Sec. 5, Taipei 116, Taiwan, R.O.C.
Phone: +886-2-2934-5456 Fax: +886-2-2934-4373
E-Mail: info@rikaline.com.tw Web: www.rikaline.com.tw

TABLE OF CONTENTS

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

1. INTRODUCTION

1.1 Overview

The GPS-6011 GPS Receiver features the revolutionary FirstGPS™ architecture. This complete enabled GPS receiver provides high position and speed accuracy performances as well as high sensitivity and tracking capabilities in urban canyon conditions. The GPS-6011 delivers major advancements in GPS performances, accuracy, integration, computing power and flexibility. This positioning application meets strict needs such as car navigation, mapping, surveying, security, agriculture and so on. Only clear view of sky and certain power supply are necessary to the unit.

1.2 Features

1. Facilitating FirstGPS™ core technology.
2. High sensitivity: to **-143 dBm** tracking, superior urban canyon performances
3. High positioning accuracy: < **3m CEP** (50%), OR <**5M CEP** (90%) without SA (horizontal)
4. Ultra low power: **17mA typical** (without antenna) -- tracking at 3.3 Volts, full power
5. Optional communication levels, RS-232 and TTL meet ordinary use and future application.
6. A rechargeable battery sustains internal clock and memory and is recharged during normal operation.
7. Dual communication channels and user selectable baud rates allow maximum interface capability and flexibility.
8. LED display status: The LED provides users visible positioning status. LED “ON” when power connected and “BLINKING” when GPS-6011 got positioned. No more extra device needed.
9. Low Cost.

1.3 FirstGPS™ Architecture Highlights

1.3.1 Industry Leading GPS Performance

1. Builds on high performance FirstGPS™ core
2. Satellite signal tracking engine to perform GPS acquisition and tracking functions without CPU intervention
3. High sensitivity: to -143 dBm tracking, superior urban canyon performances
4. Position accuracy: < 3m CEP (50%) or < 5m (90%) without SA (horizontal)
5. Warm Start is under 42 seconds (90%)
6. Hot Start is under 10 seconds (90%)

1.3.2 Low Power

1. Ultra low power integrated circuit design, optimized RF and DSP architectures
2. Further power saving thanks to 4 different power down mode

1.4 Technology specifications

1.4.1 Physical Dimension

Single construction integrated antenna and receiver.
Size: 59.0(W) x 51.0 (47.3)(D) x 20.6(H) (mm)
2.32"(W) x 2.00"(1.86)(D) x 0.81"(H).

1.4.2 Environmental Characteristics

1) Operating temperature: -40°C to +85°C(internal temperature).
2) Storage temperature: -55°C to +100°C.

1.4.3 Environmental Characteristics

1) Operating temperature: -40°C to +85°C(internal temperature).
2) Storage temperature: -55°C to +100°C.

1.4.4 Electrical Characteristics

1) Input voltage: +4.75 ~ 5.5 VDC without accessories.
2) Backup power: 3V Rechargeable Lithium cell battery, up to 1,000 hours (41.7 days) discharge.

Remark: FirstGPS™ is a trademark from Trimble.

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

1.4.5 Performance

1) Tracks up to 8 satellites.
2) Update rate: 1 second.
3) Acquisition time
   - Reacquisition 1 sec.,
   - Hot start 10 sec. (90%)
   - Warm start 42 sec. (90%)
   - Cold start 120 sec. (90%)

4) Position accuracy:
   - NON-DGPS
     - Position <3 meter (50%) or <5 meter (90%)
     - Velocity 0.05 meters/second, typical
   - DGPS (Differential GPS)
     - Position <1 meter, typical
     - Velocity 0.05 meters/second, typical

5) Dynamic Conditions:
   - Altitude 18,000 meters (60,000 feet) max
   - Velocity 515 meters / second (1000 knots) max
   - Acceleration 4 G, max
   - Jerk 20 meters/second, max

1.4.6 Important Characters

Receiver	L1, C/A code
Channels	8
Update Rate	1/second down to 1/min
Satellite Reacquisition Time	< 1 second
Hot Start	< 10 seconds (90%)
Warm Start	< 42 seconds (90%)
Cold Start	< 120 seconds (90%)
Tracking Sensitivity	-173 dBW
Power Consumption (Full Power)	< 20 mA at 3.3 Volts (Typically: 17 mA)
Voltage Supply	3.0 – 3.65 Volts
Protocol	NMEA 0183 V2.1
Position Accuracy	3 meters CEP (50%) horizontal, SA off < 1 meter, DGPS corrected

1.4.7 Interfaces

1) Dual channel RS-232 or TTL compatible level, with user selectable baud rate (4800-Default, 9600, 19200, 38400).
2) NMEA 0183 Version 2.1 ASCII output (GPGGA, GPGLL, GPGSA, GPGSV, GPRMC, GPVTG, GPZDA).
3) Real-time Differential Correction input (RTCM SC-104 message types 1, 5 and 9).

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

2. Operational characteristics

2.1 Initialization

As soon as the initial self-test is complete, the GPS-6011 begins the process of satellite acquisition and tracking automatically. Under normal circumstances, it takes approximately 120 seconds to achieve a position fix, 42 seconds if ephemeris data is known. After a position fix has been calculated, information about valid position, velocity and time is transmitted over the output channel.

The GPS-6011 utilizes initial data, such as last stored position, date, time and satellite orbital data, to achieve maximum acquisition performance. If significant inaccuracy exists in the initial data, or the orbital data is obsolete, it may take more time to achieve a navigation solution. The FirstGPS™ feature is to provide fast and accurate position. However, acquisition performance can be improved when the host system initializes the GPS-6011 in the following situation:

1) Moving further than 500 kilometers.
2) Failure of data storage due to the inactive internal memory battery.

2.2 Navigation

After the acquisition process is complete, the GPS-6011 sends valid navigation information over output channels. These data include:

1) Latitude/longitude/altitude
2) Velocity
3) Date/time
4) Error estimates
5) Satellite and receiver status

The GPS-6011 sets the default of auto-searching for real-time differential corrections in RTCM SC-104 standard format, with the message types 1, 5, or 9. It accomplishes the satellite data to generate a differential (DGPS) solution. The host system, at its option, may also command the GPS-6011 to output a position whenever a differential solution is available.

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

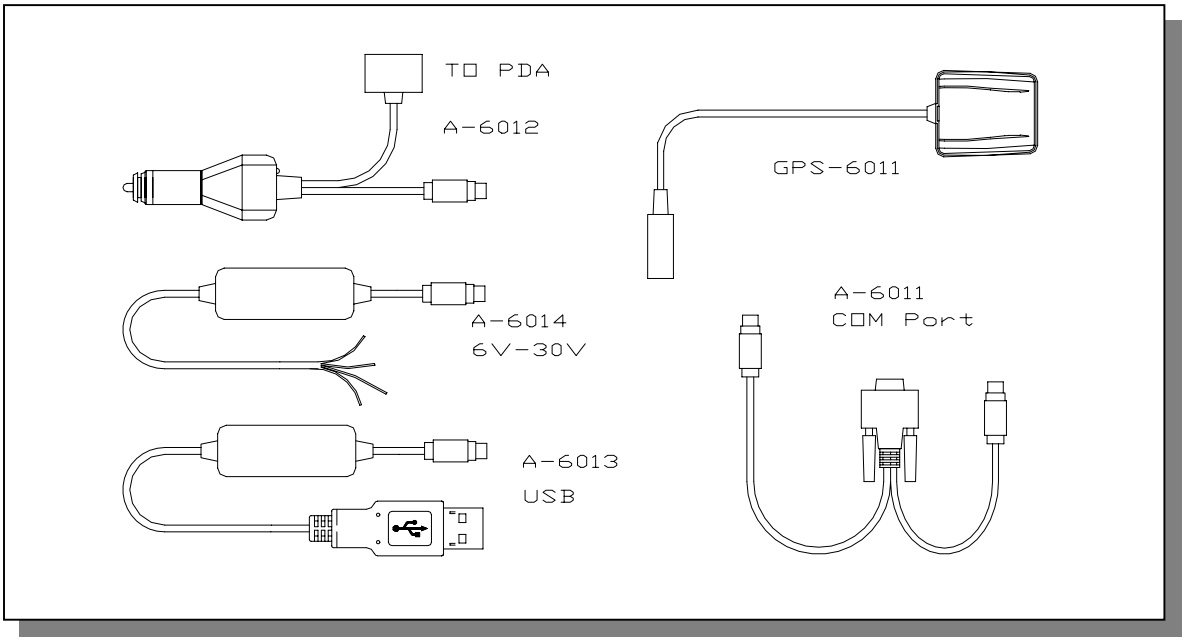
3. Hardware interface

3.1 Dimension

Size: 59.0(W) x 51.0 (47.3)(D) x 20.6(H) (mm)
2.32"(W) x 2.00"(1.86)(D) x 0.81"(H).

3.2 Hardware Interface

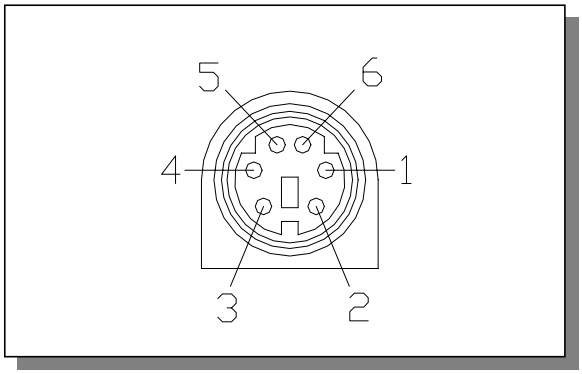
The GPS-6011 includes an antenna in a unique style waterproof gadget. Simply connect PS-2 female connector to one of the accessories linking to your notebook PC, PDA or other devices. The one-piece cigarette adapter allows you to connect GPS-6011 to your PDAs. Optional color, input voltage and output connector are listed and described below:



3.3 Connector

Standard cable: 2 meters with female PS-2 connector.
The GPS-6011 is also equipped with optional connectors cigarette adapter for PDAs.

3.3.1 Function definition of standard PS-2 composite connector



Pin	Signal
1	Tx (RS-232)
2	+5VDC
3	Tx (TTL)
4	Ground
5	Rx (TTL)
6	Rx (RS-232)

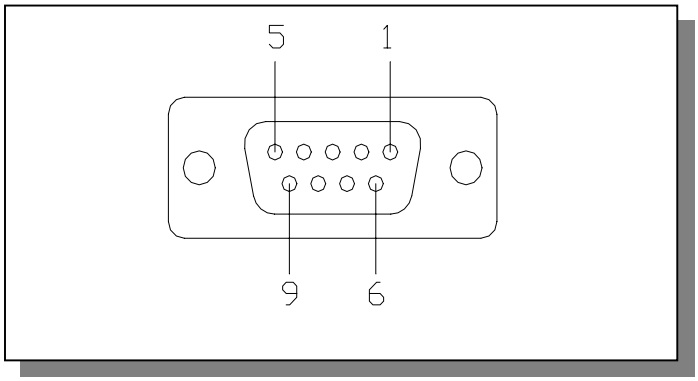
3.4 Accessories

3.4.1 A-6011 Mini Din Female and PS-2 male connector:

Cable Length: To GPS-6011: 1 meter
RS-232 to PS-2: 45 cm

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

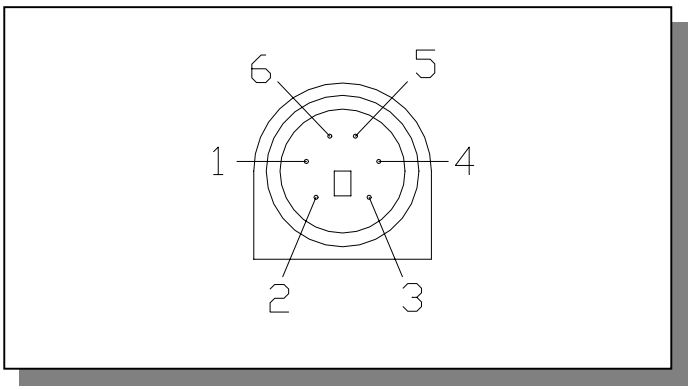
3.4.1.1 Mini Din Female connector function definition:



Pin	Signal Name
1	N.C
2	Tx
3	Rx
4	N.C
5	Ground
6	N.C
7	N.C
8	N.C
9	DGPS in

N.C = No connection

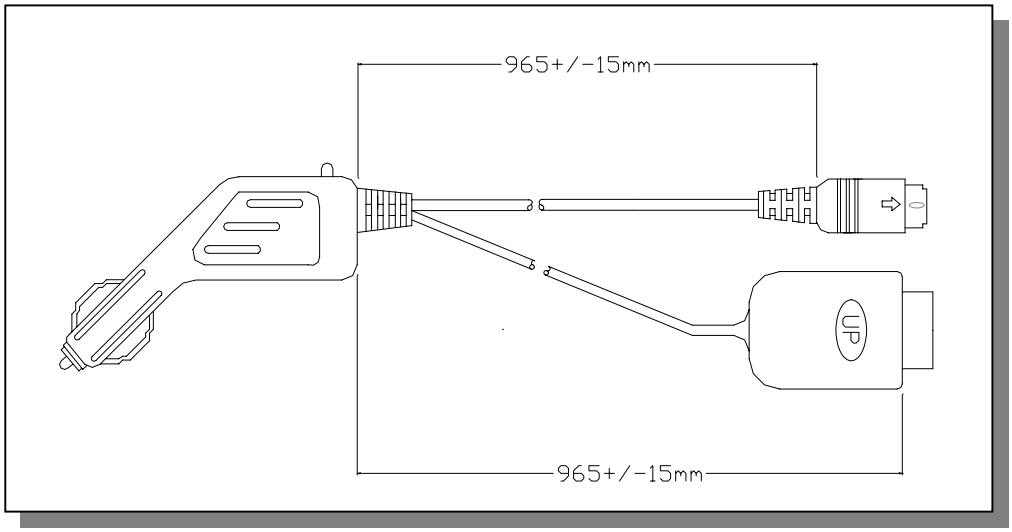
3.4.1.2 PS2 composite connector function definition (to PC):



Pin	Signal Name
1	+5V
2	N.C
3	N.C
4	Ground
5	N.C
6	N.C

N.C = No connection

3.4.2 A-6012 Cigarette adapter and PDA connector:

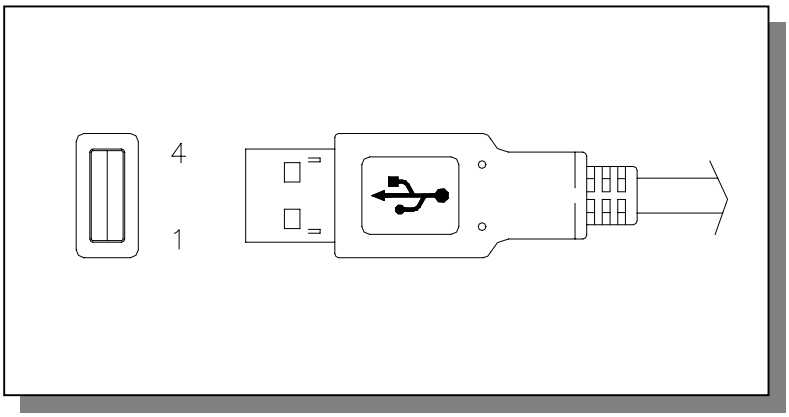


Part No.	Application	Part No.	Application
A-6017-A	ASUA	A-6012-P	Palm
A-6017-B	BESTA I-WINNA	A-6012-Q	I-Paq
A-6012-H	HP Jornada	A-6012-S	Sony Series
A-6017-L	Siemens LOOX	A-6017-T	Toshiba Series
A-6017-M	Mitac Mio	A-6017-X	O2-XDA / T-Mobile - MDA
A-6017-N	NEC		

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

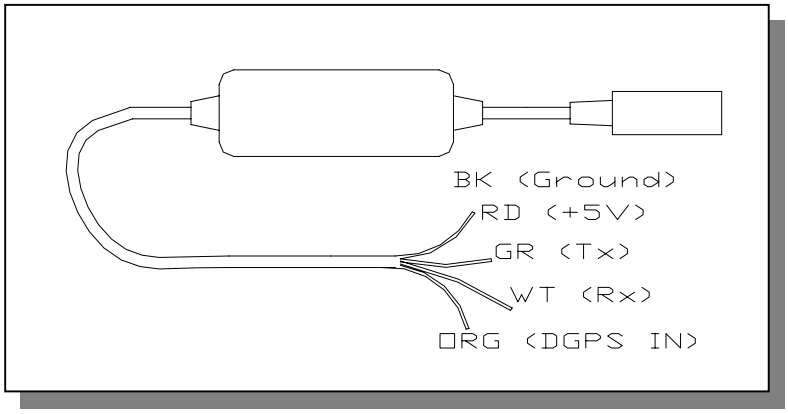
3.4.3 A-6013 USB connector

The function definition of the A Type USB connector is as follows:



Pin	Signal Name
1	+5V
2	D +
3	D -
4	Ground

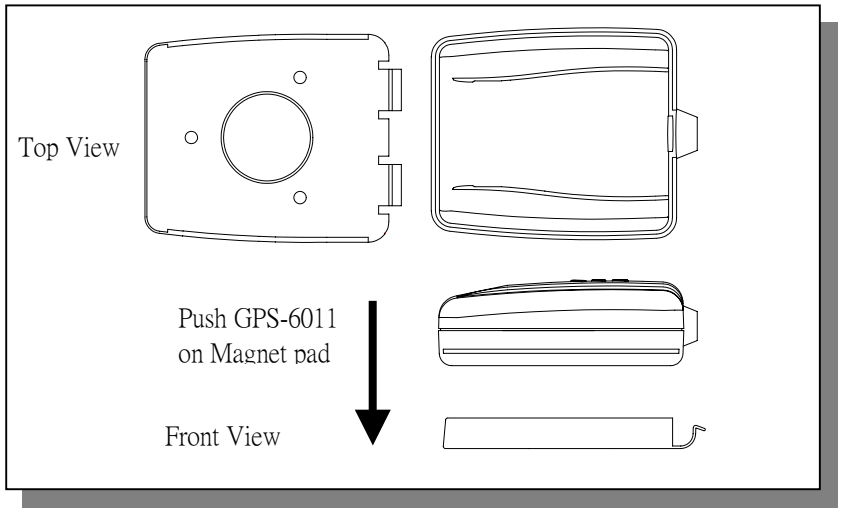
3.4.4 A-6014 High power connector



Color	Signal
Black	**Ground**
Red	**+6~30 VDC**
Green	**Tx**
White	**Rx**
Orange	**DGPS IN**

3.4.5 A-6015 Magnetic Pad (and Mounting Bracket)

The GPS-6011 is also equipped with a standard magnetic pad (Mounting Bracket), A-6015 for being put on top of the car, a plan surface or mounting on a base used as Mounting Bracket. Fasten 3 screws (Enclosed) through the magnet pad as a fixed holder.



Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

3.4.6 A-6016 Optional Cigarette Adapter

The optional cigarette adapter with 2-meter core cable is for using in a car or boat. It must be used together with A-6011.

Input voltage: DC12V - 26V

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

4. USB Driver

4.1 System Requirements

IBM, Pentium or above and other compatible PC; 16 MB and above memory; Windows 98/Me/2000; VGA Graphic Adapter.

4.2 Installation

1. Copy entire <GPS-6011 USB> folder from CD to hard disk.
2. Connect GPS-6011 USB connector to computer. While the computer automatically starts the installation program, please direct the driver to the <GPS-6011 USB> folder.
3. After the installation is complete, go to <Device Manager> and select <Ports (COM & LPT)> to verify if a virtual COM port <USB to Serial Port> was created.

4.3 Important

Verify the COM port # to start using your own navigating software.

1. Click **<Start>** menu, select **<Settings>,** then enter <**Control Panel>.**
2. After entering **<Control Panel>**, select **<System>.**
3. Select **<Device Manager>.**
4. Find the **<Connect Port>** and check the Virtual COM Port, which was created by the USB driver. Please note that the Virtual COM Port number might be different from every computer. Before using navigating software, please confirm the COM Port numbers created by your computer and provided by your navigation software. They must be the same Com Port numbers. Otherwise, the navigating software won't receive the satellite signal for the un-match COM Port setting.

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

5. Software Interface

The GPS-6011 interface protocol is based on the National Marine Electronics Association's NMEA 0183 ASCII interface specification, which is defined in NMEA 0183, Version 2.2 and the Radio Technical Commission for Maritime Services (RTCM Recommended Standards For Differential Navstar GPS Service, Version 2.1, RTCM Special Committee No.104).

5.1 NMEA Transmitted Messages

The GPS-6011 outputs data in NMEA-0183 format as defined by the National Marine Electronics Association (NMEA), Standard.

The default communication parameters for NMEA output are 4800 baud, 8 data bits, stop bit, and no parity.

Table 5-1 NMEA-0183 Output Messages

NMEA Sentence	Description
GPGGA	Global positioning system fixed data
GPGLL	Geographic position latitude \ longitude
GPGSA	GNSS DOP and active satellites
GPGSV	GNSS satellites in view.
GPRMC	Recommended minimum specific GNSS data
GPVTG	Coruse over ground and ground speed
GPZDA	Date and Time

5.1.1 Global Positioning System Fix Data (GGA)

Table 5-2 contains the values for the following example:

$GPGGA,161229.487,3723.2475,N,12158.3416,W,1,07,1.0,9.0,M, , , ,0000*18

Table 5-2 GGA Data Format

Name	Example	Units	Description
Message ID	$GPGGA		GGA protocol header
UTC Time	161229.487		Hhmmss.sss
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	W		E=east or W=west
Position Fix Indicator	1		See Table 5-3
Satellites Used	07		Range 0 to 12
HDOP	1.0		Horizontal Dilution of Precision
MSL Altitude	9.0	Meters	
Units	M	Meters	
Geoid Separation		Meters	
Units	M	Meters	
Age of Diff. Corr.		second	Null fields when DGPS is not used
Diff. Ref. Station ID	0000		
Checksum	*18		
<CR> <LF>			End of message termination

Table 5-3 Position Fix Indicator

Value	Description
0	0 Fix not available or invalid
1	GPS SPS Mode, fix valid
2	Differential GPS, SPS Mode, fix valid
3	GPS PPS Mode, fix valid

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

5.1.2 Geographic Position with Latitude/Longitude (GLL)

Table 5-4 contains the values for the following example:

$GPGLL,3723.2475,N,12158.3416,W,161229.487,A*2C

Table 5-4 GLL Data Format

Name	Example	Units	Description
Message ID	$GPGLL		GLL protocol header
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	W		E=east or W=west
UTC Position	161229.487		hhmmss.sss
Status	A		A=data valid or V=data not valid
Checksum	*2C		
<CR> <LF>			End of message termination

5.1.3 GNSS DOP and Active Satellites (GSA)

Table 5-5 contains the values for the following example:

$GPGSA,A,3,07,02,26,27,09,04,15, , , , , ,1.8,1.0,1.5*33

Table 5-5 GSA Data Format

Name	Example	Units	Description
Message ID	$GPGSA		GSA protocol header
Mode 1	A		See Table 5-6
Mode 2	3		See Table 5-7
Satellite Used (1)	07		Sv on Channel 1
Satellite Used (1)	02		Sv on Channel 2
……			….
Satellite Used			Sv on Channel 12
PDOP	1.8		Position Dilution of Precision
HDOP	1.0		Horizontal Dilution of Precision
VDOP	1.5		Vertical Dilution of Precision
Checksum	*33		
<CR> <LF>			End of message termination

(1) Satellite used in solution.

Table 5-6 Mode 1

Value	Description
M	Manual—forced to operate in 2D or 3D mode
A	2D Automatic—allowed to automatically switch 2D/3D

Table 5-7 Mode 2

Value	Description
1	Fix Not Available
2	2D
3	3D

5.1.4 GNSS Satellites in View (GSV)

Table 5-8 contains the values for the following example:

$GPGSV,2,1,07,07,79,048,42,02,51,062,43,26,36,256,42,27,27,138,42*71

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

$GPGSV,2,2,07,09,23,313,42,04,19,159,41,15,12,041,42*41

Table 5-8 GSV Data Format

Name	Example	Units	Description
Message ID	$GPGSV		GSV protocol header
Number of Messages	2		Range 1 to 3
Message Number	1		Range 1 to 3
Satellites in View	07		Range 1 to 12
Satellite ID	07		Channel 1 (Range 1 to 32)
Elevation	79	degrees	Channel 1 (Maximum 90)
Azimuth	048	degrees	Channel 1 (True, Range 0 to 359)
SNR (C/No)	42	dBHz	Range 0 to 99, null when not tracking
....	....		
Satellite ID	27		Channel 4 (Range 1 to 32)
Elevation	27	degrees	Channel 4 (Maximum 90)
Azimuth	138	degrees	Channel 4 (True, Range 0 to 359)
SNR (C/No)	42	dBHz	Range 0 to 99, null when not tracking
Checksum	*71		
<CR> <LF>			End of message termination

NOTE: Items <4>,<5>,<6> and <7> repeat for each satellite in view to a maximum of four (4) satellites per sentence. Additional satellites in view information must be sent in subsequent sentences. These fields will be null if unused.

5.1.5 Recommended Minimum Specific GNSS Data (RMC)

Table 5-9 contains the values for the following example:

$GPRMC,161229.487,A,3723.2475,N,12158.3416,W,0.13,309.62,120598, ,*10

Table 5-9 RMC Data Format

Name	Example	Units	Description
Message ID	$GPRMC		RMC protocol header
UTC Time	161229.487		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		dddmm.mmmm
E/W Indicator	W		E=east or W=west
Speed Over Ground	0.13	Knots	
Course Over Ground	309.62	Degrees	True
Date	120598		ddmmyy
Magnetic Variation		Degrees	E=east or W=west
Checksum	*10		
<CR> <LF>			End of message termination

5.1.6 Course Over Ground and Ground Speed (VTG)

Table 5-10 contains the values for the following example:

$GPVTG,309.62,T, ,M,0.13,N,0.2,K*6E

Table 5-10 VTG Data Format

Name	Example	Units	Description
Message ID	$GPVTG		VTG protocol header
Course	309.62	Degrees	Measured heading
Reference	T		True

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

Course		Degrees	Measured heading
Reference	M		Magnetic (1)
Speed	0.13	Knots	Measured horizontal speed
Units	N		Knots
Speed	0.2	Km/hr	Measured horizontal speed
Units	K		Kilometers per hour
Checksum	*6E		
<CR> <LF>			End of message termination

(1) All “course over ground” data are geodetic WGS84 directions.

5.1.7 Time & Date (ZDA)

Table 5-11 contains the values for the following example:

$GPVTG,114523.62,12,04,2001,10,34*6E

Table 5-11 zda Data Format

Name	Example	Units	Description
Message ID	$GPZDA		ZDA protocol header
Hour, Min, Sec, Sub Sec	114523.62		Hhmmss.ss
Day	12		Day in UTC, 01to 12
Month	04		Month in UTC, 01 to 12
Year	2001		Year in UTC
Local Zone Hours	10		Local zone hours, +/- 13 hours
Local Zone Minutes	34		Local zone minutes, 0 to +59
Checksum	*6E		
<CR> <LF>			End of message termination

5.2 RTCM Received Data

The default communication parameters for DGPS Input are 9600 baud, 8 data bits, stop bit, and no parity. Position accuracy of less than 5 meters can be achieved with the GPS-6011 by using Differential GPS (DGPS) real-time pseudo-range correction data in RTCM SC-104 format, with message types 1, 5, or 9. As using DGPS receiver with different communication parameters, GPS-6011 may decode the data correctly to generate accurate messages and save them in battery-back SRAM for later computing.

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

6. Earth Datums

6.1 Earth Datums

The following is a list of the GPS-6011 earth datum index

Item	Datum	Reference Ellipsoid
0	ADINDAN	Ethiopia, Mali, Senegal, Sudan
1	AFGOOYE	Somalia
2	AIN EL ABD 1970	Bahrain Island, Saudi Arabia
3	ANNA 1 ASTRO 1965	Cocos Island
4	ARC 1950	Botswana, Lesotho, Malawi, Swaziland, Zaire, Zaire, Zambia, Zimbabwe
5	ARC 1960	Kenya, Tanzania
6	Ascension Island 1958	Ascension Island
7	ASTRO BEACON “E”	Iwo Jima Island
8	AUSTRALIAN GEODETIC 1966	Australia, Tasmania Island
9	AUSTRALIAN GEODETIC 1984	Australia, Tasmania Island
10	ASTRO DOS 71/4	St. Helena Island
11	ASTRONOMIC STATION 1952	Marcus Island
12	ASTRO B4 SOROL ATOLL	Tern Island
13	BELLEVUE (IGN)	Efate and Erromango Islands
14	BERMUDA 1957	Bermuda Islands
15	BOGOTA OBSERVATORY	Colombia
16	CAMPO INCHAUSPE	Argentina
17	CANTON ASTRO 1966	Phoenix Islands
18	CAPE CANAVERAL	Florida, Bahama Islands
19	CAPE	South Africa
20	CARTHAGE	Tunisia
21	CHATHAM 1971	Chatham Island (New Zealand)
22	CHUA ASTRO	Paraguay
23	CORREGO ALEGRE	Brazil
24	DJAKARTA (BATAVIA)	Sumatra Island (Indonesia)
25	DOS 1968	Gizo Island (New Georgia Islands)
26	EASTER ISLAND 1967	Easter Island
27	EUROPEAN 1950	Austria, Belgium, Denmark, Finland, France, Germany, Gibraltar, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden Switzerland
28	EUROPEAN 1979	Austria, Finland, Netherlands, Norway, Spain, Sweden Switzerland
29	FINLAND HAYFORD 1910	Finland
30	GANDAJIKA BASE	Republic of Maldives
31	GEODETIC DATUM 1949	New Zealand
32	ORDNANCE SURVEY OF GREAT BRITAIN 1936	England, Isle of Man, Scotland, Shetland Islands, Wales
33	GUAM 1963	Guam Island
34	GUX 1 ASTRO	Guadalcanal Island
35	HJORSEY 1955	Iceland
36	HONG KONG 1963	Hong Kong
37	INDIAN	Bangladesh, India, Nepal
38	INDIAN	Thailand, Vietnam
39	IRELAND 1965	Ireland
40	ISTS 073 ASTRO 1969	Diego Garcia
41	JOHNSTON ISLAND 1961	Johnston Island
42	KANDAWALA	Sri Lanka
43	KERGUELEN ISLAND	Kerguelen Island
44	KERTAU 1948	West Malaysia, Singapore

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

45	L.C. 5 ASTRO	Cayman Brac Island
46	LIBERIA 1964	Liberia
47	LUZON	Mindanao Island
48	LUZON	Philippines (excluding Mindanao Island)
49	MAHE 1971	Mahe Island
50	MARCO ASTRO	Salvage Islands
51	MASSAWA	Eritrea (Ethiopia)
52	MERCHICH	Morocco
53	MIDWAY ASRTO 1961	Midway Island
54	MINNA	Nigeria
55	NORTH AMERICAN 1927	Alaska
56	NORTH AMERICAN 1927	Bahamas (excluding San Salvador Island)
57	NORTH AMERICAN 1927	Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua)
58	NORTH AMERICAN 1927	Canal Zone
59	NORTH AMERICAN 1927	Canada (including Newfoundland Island)
60	NORTH AMERICAN 1927	Caribbean (Barbados, Caicos Islands, Cuba, Dominican Republic, Grand Cayman, Jamaica, Leeward Islands, Turks Islands)
61	NORTH AMERICAN 1927	Mean Value (CONUS)
62	NORTH AMERICAN 1927	Cuba
63	NORTH AMERICAN 1927	Greenland (Hayes Peninsula)
64	NORTH AMERICAN 1927	Mexico
65	NORTH AMERICAN 1927	San Salvador Island
66	NORTH AMERICAN 1983	Alaska, Canada, Central America, CONUS, Mexico
67	NAPARIMA, BWI	Trinidad and Tobago
68	NAHRWAN	Masirah Island (Oman)
69	NAHRWAN	Saudi Arabia
70	NAHRWAN	United Arab Emirates
71	OBSERVATORIO 1966	Corvo and Flores Islands (Azores)
72	OLD EGYPTIAN	Egypt
73	OLD HAWAIIAN	Mean Value
74	OMAN	Oman
75	PICO DE LAS NIEVES	Canary Islands
76	PITCAIRN ASTRO 1967	Pitcairn Island
77	PUERTO RICO	Puerto Rico, Virgin Islands
78	QATAR NATIONAL	Qatar
79	QORNOQ	South Greenland
80	REUNION	Mascarene Island
81	ROME 1940	Sardinia Island
82	RT 90	Sweden
83	PROVISIONAL SOUTH AMERICAN 1956	Bolivia, Chile, Colombia, Ecuador, Guyana, Peru, Venezuela
84	SOUTH AMERICAN 1969	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Venezuela, Trinidad and Tobago
85	SOUTH ASIA	Singapore
86	PROVISIONAL SOUTH CHILEAN 1963	South Chile
87	SANTO (DOS)	Espirito Santo Island
88	SAO BRAZ	Sao Miguel, Santa Maria Islands (Azores)
89	SAPPER HILL1943	East Falkland Island
90	SCHWARZECK	Namibia
91	SOUTHEAST BASE	Porto Santo and Madeira Islands
92	SOUTHWEST BASE	Faial, Graciosa, Pico, Sao Jorge, and Terceira Islands (Azores)
93	TIMBALAI 1948	Brunei and East Malaysia (Sarawak and Sabah)
94	TOKYO	Japan, Korea, Okinawa

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

95	TRISTAN ASTRO 1968	Tristan da Cunha
96	USER DEFINED EARTH DATUM	
97	VITI LEVU 1916	Viti Levu Island (Fiji Islands)
98	WAKE-ENIWETOK 1960	Marshall Islands
99	WORLD GEODETIC SYSTEM 1972	
100	WORLD GEODETIC SYSTEM 1984	
101	ZANDERIJ	Surinam
102	CH-1903	Switzerland
103	HU-TZU	Shan
104	INDONESIA 74	
105	AUSTRIA	
106	POTSDAM	
107	TAIWAN	(Modified Hu-Tzu-Shan)

6.2 Setting Syntax

6.2.1 Manufacturing Default:

Datum: WGS84.
Baud Rate: 4800.
Output: GGA, GSA, GSV, RMC.

6.2.2 Datum change syntax:

Please refer separate instruction.

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

7. Ordering Information

7.1 Product Options

7.1.1 Output Level (or Data)

GPS-6011: RS-232 & TTL

7.1.2 Color Option

BK Black (Standard)
Other Color: by demand

7.2 Accessories

A-6011 Com Port connector (Standard, packed in color box)
A-6013 USB connector
A-6014 High power connector, 6-30VDC
A-6015 Magnetic pad
A-6016 Cigarette adapter

A-6012 / 6017 PDA connector with Cigarette Adapter

	Part No.	PDA
1	A-6017-A	ASUS A-600
2	A-6017-B	BESTA I-WINNA
3	A-6012-C	Casio E-115
4	A-6012-C1	Casio E-125
5	A-6012-C2	Casio E-200
6	A-6012-H	HP Jornada 565/568
7	A-6012-HS	HandSpring Treo
8	A-6012-HS1	HandSpring Visor\Prism
9	A-6012-HS2	HandSpring Edge
10	A-6017-L	Siemens LOOX
11	A-6017-M	Mitac Mio 528
12	A-6017-N	NEC 300E
13	A-6012-P	Palm Vx
14	A-6012-P1	Palm / IBM WorkPad 500/505
15	A-6012-Q	I-Paq 36xx
16	A-6012-Q1	I-Paq 38xx
17	A-6017-Q1	I-Paq 38xx
18	A-6012-S	Sony N-7xx
19	A-6012-S1	Sony T-6xx
20	A-6017-SM	Siemens SX-45
21	A-6012-T1	Toshiba E-570
22	A-6017-T2	Toshiba E-330/740
23	A-6017-X	O 2 – XDA / T-Mobiles – MDA

Remarks: A-6012 series is 500mA
A-6017 series is 2A

7.3 Products Combination

7.3.1 Standard package

GPS-6011 (GPS Receiver) + A-6011 (ComPort & PS-2 Connector)

7.3.2 Other Combination for GPS Application

7.3.2.1 Popular GPS Application

GPS-6011 + GPS system for Tracking, Security, Fleet Management…and so on

7.3.2.2 Navigation

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw

GPS-6011 Notebook PC Navigation (COM version)
GPS-6011 + A-6013 Notebook Notebook PC Navigation (USB version)
GPS-6011 + A-6012 PDA Navigation

8. Warranty

The GPS-6011 is warranted to be free from defects in material and functions for one year from the date of purchase. Any failure of this product within this period under normal conditions will be replaced at no charge to the customers.

Rikaline Marketing Corp. 5F-1, 125, Roosevelt Rd., Sec. 5, Taipei, Taiwan 116
Tel: ++886 2 2934 5456 Fax: ++886 2 2934 4373 E-mail: info@rikaline.com.tw Web: www.rikaline.com.tw